# ST.ANNE'S

## COLLEGE OF ENGINEERING AND TECHNOLOGY

ANGUCHETTYPALAYAM, PANRUTI – 607106.

**QUESTION BANK**

**DECEMBER 2018 - JUNE 2019 / EVEN SEMESTER**

**BRANCH:** ECE **YR/SEM:** IV / VIII **BATCH**: 2015 - 2019

**SUB CODE/NAME: E**C6802 - WIRELESS NETWORKS

**UNIT I**

**WIRELESS LAN**

**PART - A**

1. State the significance of radio transmission over infrared. [Apr/May 2017]
2. What is meant by Infrastructure networks. (May/June 2013)
3. Draw the architecture of IEEE 802.11. [June 2012]
4. What are the tasks of MAC and MAC Management? (Or) What are the responsibilities of MAC management sub layer in 802.11? *(*Dec 2014, Nov 2017*)*
5. What are the three phases in medium acces divided by EY-NPMA? (Nov/ Dec 2013)
6. What is called WATM? (May/June 2013)
7. Draw the protocol stack of Bluetooth. [Dec 2013](Or)
8. Give the protocol stack involved for Bluetooth communication. *]*Dec 2012]
9. What are the General Characteristics of Blue tooth? (or)
   List any four important features of bluetooth technology. (May 2015)
9. Write about the different devices with different roles in Bluetooth. *(*May/June 2012*)*
10. Name the four state of Bluetooth. *(*Dec 2014)
11. What is the functionality of L2CAP? List the different types of logical channels. [Nov 2017]
12. Write the expansion for WiMax and features of the system. [April 2014]
13. What is the frequency band channel bandwidth specification of WiMax standard? [April 2014]
14. OFDM uses a set of orthogonal subcarriers for transmission of data. OFDM is used in WLANs. Consider an OFDM system that uses 52 sub-carriers out of which 48 are pilot subcarriers. System bandwidth is 20MHz and OFDM symbol duration including cyclic prefix is $4\,\mu s$ . If code rate is ¾ and 64 QAM is used, find the data rate. [Apr/Mar 2017]
15. What are the functional groups of MAC Management?
16. What is meant by Reassociation Request and Reassociation Response?
17. Give the diagramatic representation of Phases of the HIPERLAN 1 EY-NPMA access scheme
18. Give any two services provided by WATM.
19. What are the different requirements should be set up for handover?
20. What are the several requirements for location management?
21. Draw the diagram of Detailed IEEE 802.11 protocol architecture and management.
22. What is the task of PMD and PHY Management?
23. What is the task of Station Management in IEEE 802.11protocol management?
24. What are the three different physical layers supported by IEEE 802.11?
25. What are the specifications of Frequency hopping spread spectrum version of Physical layer?
26. What do you know about Direct Sequence spread spectrum version of Physical layer?

27. What is meant by Reassociation Request and Reassociation Response?
28. What is Access Point accepting the Reassociation Request?
29. Give any three difference between HIPERLAN1 and HIPERLAN2 [Apr/May2018]
30. What is IEEE 802.11?What are the functions of MAC layer in IEEE 802.11?

## PART - B

### WLAN TECHNOLOGIES

1. Discuss the advantages and disadvantages of Wireless LAN in detail. [16m - Nov 2013]
2. Compare Infrared and Radio transmission**.**

### IEEE 802.11

3. With a suitable block diagram, explain the IEEE 802 .11 Architecture. (16) (June/July 2013)
4. Explain the components of an Infrastructure of a, b and wireless part of an IEEE 802.11 standard Architecture system. (16) (Nov/ Dec 2013)
5. Compare the different versions of IEEE 802.11 standards respect to data rate, modulation techniques, operating frequency and applications (May/June 2014)
   Explain in detail about the IEEE 802.11 protocol architecture and bridging with other networks. (16) (Nov 2017)

### IEEE802.11 MAC sub layer

6. Why do you have the two divisions in the MAC layer itself for IEEE 802.11 and explain in detail about the MAC sub layer. (16) Dec 2015
7. With suitable diagram, explain in detail about MAC sublayer of IEEE 802.11. (16) Dec 2015
8. Describe the MAC layer features and functions and functionalities of IEEE 802.11 Wireless LAN.(10) May 2015
9. Explain the following corresponding to 802.11 MAC sublayer. Apr 2014
   a) Reliable data delivery(4)
   b) .Access control (4)
   c) MAC Frame Format (4)
10. With suitable diagram, explain in detail about MAC sublayer of IEEE 802.111 (16) May 2016
11. Explain and compare the medium access mechanism of DCF methods adopted in IEEE 802.11 WLAN.(16) May 2017

### HIPERLAN

12. Write short notes on HYPERLAN.(8) Dec 2014, May 2016

### HIPERLAN 1

13. State the features and requirements of HIPERLAN standard.(4)
14. Classify the HIPERLAN standard based on their architecture and protocol specification(12) May 2015

### lHiperLAN2

15. Explain the architecture and sublayers of HIPERLAN(16) Apr 2014,May 2016
16. Define Hiperlan-2. Discuss about the various operation modes and protocol stack in Hiperlan-2. Dec 2017

### WATM

17. Explain in detail about WATM.

**BRAN**

18. Explain in detail about BRAN.

**HiperLAN2**

19. Explain the architecture and sublayers of HIPERLAN(16) Apr 2014 May 2016
20. Define Hiperlan-2. Discuss about the various operation modes and protocol stack in Hiperlan-2.(16)Nov2017

**BLUETOOTH- Architecture**

21. With neat diagrams explain the protocol and architecture of Bluetooth in detail(16) Jun 2014
22. Draw and explain protocol architecture of Bluetooth(16) Dec2014
23. With diagram explain the layered architecture of Bluetooth(10) May 2015
24. Explain the architecture and MAC layer details of Bluetooth system.(16) Apr 2014
25. Describe the user scenario architecture and protocol stack of Bluetooth technology.(16) Apr 2017
26. What are the functions of Bluetooth protocol stack? Explain (May / June 2014)
27. Explain in detail about Link manager protocol in Blutooth
28. Explain in detail about Security in Bluetooth

**WIMAX: Physical layer, MAC, Spectrum allocation for WIMAX**

29. Write short notes on WiMAX Standard(8) Dec 2014
30. What is the need of Wireless MAN? With schematic explain MAC layer details of WiMax(10) May 2014
31. In detail, explain the physical and MAC layer details of WiMax network.(16)Aprl2014

## UNIT II

## MOBILE NETWORK LAYER

### PART - A

1. What is Agent solicitation? [Nov/ Dec 2016]
2. When the agent solicitation message has to be sent by mobile node? [Nov 2017]
3. Define encapsulation and decapsulation. [Nov/ Dec 2012]
4. What is encapsulation in Mobile IP? [Apr 2017]
5. Define security parameter index. (May/Dec 2013)
6. What are the two different types of destination addresses that can be assigned to a mobile node while it is attached to a foreign network? (or)What is care of address in Mobile IP? [Apr/Mar 2017]
7. Distinction between a mobile user and a nomadic user. [Nov/ Dec 2014]
8. What are the characteristics of a Ideal Routing protocol for Adhoc wireless networks? (Nov/ Dec 2014)
9. Write the advantages and disadvantages of TORA. (May/June 2013)
10. What is an ad hoc wireless network? (May/June 2013)
11. State Hidden terminal problems in adhoc wireless network. (Nov 2014)
12. What are the different categories of the multicast routing protocols? (May/June 2012)
13. Distinguish between adhoc wireless network and wireless sensor network. [May 2015, Nov 2013]
14. What are the characteristics of MANET?(Nov 2014, Nov 2013)
15. Why is routing in multi-hop ad-hoc networks complicated? [Nov 2017]
16. What is care of address in mobile IP? (Apl/May2017)
17. What is encapsulation in mobile IP? (Apl/May2017)
18. What are additional messages needed by optimized Mobile IP?

19. Give the configuration of DHCP.
20. Write about the two different problems in DSR (Dynamic source routing).
21. Draw and explain thePerformance enhancing proxy.
22. What are the difference between Proactive and Reactive Routing protocols?
23. List out the several issues of the multicast routing protocol.
24. What are the ways available for deletion of the multicast tree ?
25. Write the advantages and disadvantages of CGSR.
26. What are the metrices of Power Aware Routing Protocols?
27. Write the advantages and disadvantages of AODV.
28. List out the several issues of the multicast routing protocol.
29. Distinguish Hidden & exposed terminal problems in adhoc wireless network
30. What are the Applications of ad hoc network?

**PART – B**

**MOBILE IP**

1. State the entities and terminologies used in Mobile IP along with tunneling and also explain the three types of encapsulation mechanisms used in triangle routing (16) Apr 2017
2. Explain mobile management in Mobile IP. What is meant by triangle routing?(16) Nov 2013
3. Explain in detail about the underlying protocol support for the Mobile IP. (Or)Discuss the concept of agent discovery in Mobile IP.
4. Explain the process of Registration and authentication in Mobile IP

**TUNNELING**

**5.** State the entities and terminologies used in Mobile IP along with tunneling and also explain the three types of encapsulation mechanisms used in triangle routing(16) Apr 2017

6. Explain how tunneling works in general and especially for mobile IP using IP in IP, minimal and generic routing encapsulation respectively. Discuss the advantages and disadvantages of these three methods.(16) Nov 2017

**7**. Explain in detail about reverse tunnelling.

## IPv6

8. Discuss in detail about IPv6**.**

**DYNAMIC HOST CONFIGURATION PROTOCOL (DHCP)**

9. Explain the dynamic host configuration protocol.
10. Explain and compare the working mechanism of both destinations sequence distance vector and dynamic source routing protocol when applied on a mobile adhoc network scenario.(16)Apr/May 2017)

**MOBILE AD-HOC NETWORK**

11. Discuss in detail about various routing algorithms.

**ROUTING ALGORITHMS**

12. Explain the concept of destination sequence distance vector algorithm.
13. How does dynamic source routing handle routing? What is the motivation behind dynamic source routing compared to other routing algorithms for fixed networks?(16) Apr 2017
14. Explain the following protocols.
    a) Flat ad hoc routing
    b) Hierarchical Ad hoc routing
    c) Geographic position assisted Ad hoc routing
15. Discuss about the network layers in the internet**.**
16. Explain in detail about session initiation protocol.

## UNIT – III
## MOBILE TRANSPORT LAYER

### PART - A

1. Mention the advantages of Mobile TCP? [Apr 2017]
2. What are the disadvantages of Indirect TCP? [Apr 2017]
3. What is meant by fast retransmit? (or) Define fast retransmit. (Nov 2017)
4. What is the need for I-TCP? (Nov/Dec 2017)
5. Define feast recovery (Nov/Dec 2017)
6. Draw the Snooping agent TCP in wireless environment
7. List out the configuration parameters for TCP in a wireless environment
8. Define Large Maximum Segment Size (MSS).
9. Define Congestion control.
10. Briefly write about the scenario for the occurrence of congestion.
11. What is the effect of doubling the congestion window?
12. What is meant by fast recovery?
13. What the situations for the use of slow starts under wrong assumptions?
14. What are the methods used to increase TCP’s performance in wireless and mobile environments?
15. What are the two competing approaches led to the development of indirect TCP?
16. What are the functions of Foreign agent?
17. What is meant by slow start mechanism?
18. How to adjust the congestion window in case of Split TCP connection protocol?
19. Draw the Split connection (indirect) TCP in wireless environment.
20. Draw the Snooping agent TCP in wireless environment.
21. Write the characteristics that are deploying applications over 2.5 / 3G wireless inks.
22. List out the configuration parameters for TCP in a wireless environment.
23. Define Large window size.
24. Define Limit transmit.

25. What is Time-stamp?
26. Define Congestion control.
27. Briefly write about the scenario for the occurrence of congestion
28. What are the mechanisms followed to alter the transmission rate when congestion occurred?
29. What is meant by slow start mechanism?
30. What is the effect of doubling the congestion window?

## PART – B

### TRANSMISSION CONTROL PROTOCOL

1. Explain in detail about TCP enhancements for wireless networks. (or)
2. Discuss various approaches suggested to improve end-to-end TCP performance over wireless links. (or)
3. Compare various schemes used to improve TCP's performance in wireless and mobile environment. (or)
4. Discuss about the characteristics to be considered in deploying applications over 2.5/3G wireless links

### TRADITIONAL TCP

5. Explain in detail about the following traditional TCPs.(16) (D)
   (a) Congestion control
   (b) Slow start
   (c) Fast retransmit / Fast Recovery
   (d) Implications on mobility
   (or)
6. Describe the working mechanism of traditional TCP.(16) Apr 2017 (I)

   Describe the basic concepts of congestion control. What are the implications on mobility in traditional TCP?(16) Nov 2017 (or)

7. Discuss the mechanisms to alter the transmission rate when congestion occurs.(16) (D)

### CLASSICAL TCP IMPROVEMENTS

8. Briefly discuss about the implications on mobility.(16) (D)

9. Explain the classical TCP improvement methods to increase TCP's performance in wireless and mobile environments (D) 16
10. Discuss the classical TCP improvement methods. (I) (8)
11. Write your understanding on indirect TCP, Snooping TCP, Mobile TCP and transaction oriented TCP.(16) Apr 2017 (D) 16
12. Explain the Indirect TCP method to increase TCP Performance. (8)
13. Explain the Snooping TCP method to increase TCP Performance. What is meant by snooping TCP? (08m – Nov 2017)
14. Explain the Mobile TCP method to increase TCP Performance. 16
15. Explain the Fast retransmit/fast recovery method to increase TCP Performance. (8)
16. Explain the Transmission/time-out freezing method to increase TCP Performance. (8)
17. Explain the Transaction oriented TCP method to increase TCP performance. (8)
18. Compare various classical enhancements to TCP for mobility (8)
19. Draw the overview of classical enhancements to TCP for mobility(6) A/M 2018
20. Explain in detail about Traditional TCP and its significance(10) A/M 2018

**TCP OVER 2.5/3G WIRELESS NETWORKS**

21. Discuss the TCP over 2.5/3G networks. (or)Explain in detail about the basic concepts of TCP over 2.5/3G wireless network. (08m - Nov 2017)
22. How the mobile TCP is playing the important role in mobile transport layer? Explain with overview of the classical enhancement to TCP for mobility and compare with 2.5/3G wireless networks.(5+5+6) A/M 2018

## UNIT-4

## WIRELESS WIDE AREA NETWORK

### PART-A

1. What is Firewall? (Nov 2017)
2. What is the purpose of firewall used in UMTS network? (April 2017)
3. What is DNS/DHCP?
4. List the performance improvements in HSDPA.
5. Give the basic operational principles behind HSDPA
6. What is HS-SCCH?
7. What are the modules of mobile equipment?
8. Draw the architecture of E-UTRAN.
9. Name the 3G radio access schemes identified to support different spectrum scenario. (April 2017)
10. How is isolation between users in the downlink accomplished in a WCDMA? (Nov 2017)

11. What are the nonexclusive options hold by GSM operators for evolving their networks to 3G wideband multimedia operation?
12. What are the services and functions of Radio Resource Control (RRC)?
13. Mention the responsibility of Medium Access Layer (MAC).
14. What is control plane in LTE?
15. What are the sub layers of User Plane in LTE?
16. Draw the architecture of Evolved Packet Core *EPC.*
17. Draw the architecture of E-UTRAN.
18. What are the main components of LTE network architecture?
19. List out UE capabilities
20. Mention the functions of LTE**.**
21. What is meant by SAAL – NNI?
22. What does an IP-based signaling bearer consist?
23. What are the functions of Basic inter-RNC mobility in $I_{ur}$ interface?
24. What is $I_{ub}$ interface and what is the function of the same?
25. What does $I_{ub}$ interface carry?
26. List the uses of protocol in *Iub* interface.
27. What does UCN consist?
28. What are the functions of 3G-SGSN?
29. What is HSDPA?
30. List the performance improvements in HSDPA.

## PART-B

### UMTS TERRESTRIAL RADIO ACCESS NETWORK OVERVIEW

1. Explain in detail about UMTS Terrestrial Radio Access Network (UTRAN).
2. Discuss in detail about logical interfaces of UTRAN. (or)Discuss the role of the access link control application part (ALCAP) in the UMTS. (16m – Nov 2017)
3. Discuss various protocol architecture on $I_u$ interface.
4. Explain in detail about $I_{ur}$ interface protocol architecture.
5. Explain the UMTS network architecture with GSM, 3G and also explain the reference architecture

### UMTS CORE NETWORK ARCHITECTURE

6. Explain UMTS Core Network (UCN) Architecture. (16m - April 2017)

### HIGH-SPEED DOWNLINK PACKET ACCESS (HSDPA)

7. Discuss a bout High-Speed Downlink Packet Access (HSDPA).
8. List the improvements in performance are achieved by HSDPA.
9. Explain the Basic operational principles behind HSDPA.
10. Discuss in detail about implementation issues or architectural issues of HSDPA.

11. Explain about New channels introduced in HSDPA
12. List out UE capabilities and Tabulate UE categories in HSDPA.

**LTE NETWORK ARCHITECTURE**

13. Explain in detail about LTE network architecture.
14. Distinguish between 2G/3G and LTE.(8)
15. Discuss briefly about LTE Radio Protocol Architecture
16. Explain about LTE Protocol Stack Layers.
17. Discuss two evolution paths for the GSM to offer 3G services. [16m, Dec 2017]

**UNIT-V**

**4G NETWORKS**

**PART-A**

1. What are the standards used in public and residential domains?
2. What is an infrastructure component? (Or) What is hotspot?
3. Write about the 4G integration.
4. Compare the key parameters of 4G with 3G.
5. What are the features of the 4G systems will be? (April 2017)
6. How 4G is advanced than 3G?
7. What are the features of the 4G systems will be? (April 2017)
8. What are the keys of 4G infrastructure?
9. Write some of the key features (primarily from users' points of view) of 4G mobile networks. (April 2017)
10. Write any three key challenges and their proposed solutions. (April 2017)
11. Write some of the applications of the 4G technology. (Dec 2017)
12. What is multicarrier modulation? (or) Define multicarrier modulation. (April 2017)
13. Write the expression for signal-to-noise ratio (SNR) in MCM?
14. How to optimize the overall performance of OFDM with TDMA?
15. What are the features of MIMO systems?
16. What is the concept of MIMO systems?
17. How the SNR will be affected in MISO compared to SISO? Give the expression.
18. How efficient packet data transmission is achieved using TCP in 4G?
19. How the system performance is improved in BLAST system?
20. What are the assumptions made in BLAST receiver model?
21. Write the expressions for SNR and channel capacity of Single-input, multiple-output system.
22. What is multiple-input, single-output system?

23. How the SNR will be affected in MISO compared to SISO? Give the expression.
24. What is MIMO? Give the expressions.
25. How efficient packet data transmission is achieved using TCP in 4G?
26. Write about BLAST system.
27. How the system performance is improved in BLAST system?
28. What is Maximum-Likelihood (ML) detection algorithm? How it is complex than other algorithms?
29. What is cognitive radio? (Dec 2017)
*30.* What are the advantages in SDR?

**PART-B**

**FOURTH GENERATION SYSTEMS AND NEW WIRELESS TECHNOLOGIES**

1. Explain in detail about the fourth Generation Systems and new wireless technologies
2. Compare the key parameters of 4G with 3G
3. Explain the visions of 4G.
4. Enumerate the feature and challenges of 4G technology.
5. Discuss the key challenges of 4G and their proposed solutions.
6. Discuss the applications of 4G technology

**4G TECHNOLOGIES**

7. Explain the multicarrier modulation 4G technology.

**SMART ANTENNA TECHNIQUES**

8. Explain the smart antenna techniques in 4G technology. (16m – April 2017) (or)
9. What is multi input multi output (MIMO) system? Explain in detail. (16m – Nov 2017)

**OFDM-MIMO SYSTEMS**

10. Explain adaptive modulation and coding with time-slot scheduler along with cognitive radio concept. (16m – April 2017) (or) Describe the basic concepts of adaptive modulation and coding with time-slot scheduler. (16m – Nov 2017)

**SOFTWARE-DEFINED RADIO**

**11.** Discuss in detail about software-defined radio.

**COGNITIVE RADIO**

12. Explain in detail about cognitive radio.

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